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COUNT RUMFORD'S
CHIMNEY FIRE-PLACES
IMPROVED,

By making the whole Apparatus of CAST IRON.

CONTAINING

THE OUTLINES OF HIS PLAN,

AND

HINTS RESPECTING THE COMPARATIVE EXCELLENCE
OF THE VARIOUS MATERIALS EMPLOYED
IN THE EXECUTION OF IT.

BY WILLIAM BRAIDWOOD and SON,
No. 6. Hunter's Square, Edinburgh.

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COUNT RUMFORD'S CHIMNEY FIRE-PLACES IMPROVED[*].

The following Advertiſement lately appeared in the Edinburgh News-papers.

W. **Braidwood** and **Son** reſpectfully inform their Cuſtomers and the Public, that they have invented a new and improved method of conſtructing grates, on the principles maintained in Count Rumford's eſſay, with this ſingle difference, that they uſe iron inſtead of bricks or ſtones; the former being more durable than the latter, and probably not leſs adapted to the uſeful purpoſe of reflecting the heat which it receives from burning fuel.

Juſtice to their Employers, as well as deference to the reſpectable name of Count Rumford, prevented W. B. and Son from offering any thing of this ſort to the Public, until, after a cloſe inveſtigation of the ſubject, they ſhould be able to furniſh grates exactly conformable to Count Rumford's plan. They have now a moſt complete method of finiſhing the whole apparatus in caſt iron, a ſample of which may be ſeen at their ware-houſe. The grates are ſo conſtructed as to comprehend all the improvements ſuggeſted by Count Rumford, while more attention is paid to neatneſs and convenience, than can be attempted by any building of brick or ſtone.

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[*] To prevent miſtakes, W. Braidwood and Son think it neceſſary to ſay expreſsly, that they do not recommend any deviation from Count Rumford's leading principles, of which on the contrary, they highly approve. The firſt article mentioned in the advertiſement is preciſely agreeable to his plan in all reſpects: it is *the very ſame thing, executed in caſt iron.* This of itſelf, however, produces ſome very conſiderable improvements, which are explained in the following pages.

They have alſo fitted up a new kind of regiſter ſtoves, which, with a more elegant appearance, anſwer the ſame purpoſe in a conſiderable degree, by diminiſhing the throat of the chimney, and having the covings or ſide-plates joined to a vertical back, at the preciſe angle to which Count Rumford gives the preference.

Such of their Employers as prefer a building of ſtone, may have their chimnies altered in that manner by the beſt workmen, and grates of a proper ſhape, and exact dimenſions fitted to them. Chimnies already altered will alſo be furniſhed with ſuitable grates. Every part of the work will be executed with punctuality and care.

All other ſorts of Carron grates and ſtoves, fenders, fire irons, kitchen grates, jacks, light tinned caſt iron pots, goblets, ſtewing pans, *&c.* and in general, all iron-mongery articles which are neceſſary for houſehold furniſhings.

No. 6. Hunter's Square,
Edin. Nov. 8. 1797.

THE authors of the above advertiſement, on their firſt peruſal of Count Rumford's eſſay, were convinced that his plan of conſtructing chimnies was a very conſiderable improvement, particularly with reſpect to the increaſe of heat, and the conſequent ſaving of fuel. They were more doubtful, and ſtill they acknowledge themſelves doubtful, how far experience will juſtify his aſſertion, that the ſame plan will operate as a cure on *all* ſmoking chimnies. Undoubtedly it has this effect in many caſes; in others it has a meliorating tendency; and in ſome ſingular inſtances perhaps it may not have produced an alleviation of this evil. No method has hitherto been invented, which will prove a remedy in all caſes without exception, and it ſeems unreaſonable to expect ſuch an univerſal influence from any one ſpecific mode of cure. Count Rumford, however, is entitled to the eſteem and gratitude of mankind, for devoting his talents with unwearied aſſiduity to objects of public uſefulneſs, and particularly for his diſintereſted * publication of a plan by which, in many inſtances, ſmoking chimnies have been cured, or greatly meliorated; and by which, in all caſes, a vaſt increaſe of heat is obtained, and much fuel ſaved. It is a matter of ſome importance to decide which ſort of materials is moſt likely to ſecure theſe advantages, and moſt convenient in other reſpects.

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* Every one who reads the Eſſay, and particularly the note in page 355, will be convinced that the epithet *diſintereſted*, is here applied with the utmoſt propriety.

But it is proper, firſt of all, for the information of thoſe who may not have ſeen the eſſay on chimney fire-places, to give ſome idea of

COUNT RUMFORD's Plan *.

He conſiders the immoderate ſize, and the bad conſtruction of the throats of chimnies, which are generally ſituated near the lower part of the lintel, as the principal cauſes of ſmoke, and as the means of waſting, and carrying up the chimney a very great proportion of "the heat which is generated by the combuſtion of fuel." He propoſes to remedy theſe evils, by leſſening the width of the throat of the chimney, by placing the covings in a more oblique direction than has been hitherto the uſual practice, and by bringing the front of the grate as far forward as poſſible.

In order to accompliſh theſe beneficial purpoſes, a new back is built at the diſtance of four inches at leaſt, and not more than five inches from the top of the breaſt of the chimney, where the upright canal of the chimney begins, and it is carried up perpendicularly to that height, or a few inches higher. The back and covings muſt be always perfectly upright; and the covings ſhould never be made circular, nor in the form of any other curve, but always quite flat.

"The beſt form for the vertical ſides, or covings of a fire place, is that of an upright plane, making an angle with the plane of the back of the fire place of 135 degrees," which is preciſely the angle formed by drawing a line between two of the oppoſite corners of a ſquare. Theſe poſitions of the back and covings are the moſt favourable "for cauſing the direct rays from the fire which ſtrike againſt them, to be ſent into the room by reflection in the greateſt abundance." The covings are carried up to an equal height with the back; and all the three end abruptly; the ſpace between them and the old back and covings being filled up, to give ſolidity to the building, which finiſhes with a flat top; and this is thought of much importance for preventing ſmoke. "Care ſhould be taken in building up theſe new walls, to unite the back to the covings in a ſolid manner."

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* A conſiderable part of what follows, to p. 7. is cited from Count Rumford's Eſſay, though the pages are not referred to. Thoſe who wiſh to obtain further information, will need to peruſe the whole Eſſay. All that is intended here is to give ſuch an exact compendium of the practical part of it, as will make the plan intelligible to moſt readers.

It muſt be obſerved, however, that it is neceſſary to leave a vacant ſpace at the upper part of the back, in order to give a paſſage for the chimney-ſweeper. “This opening, or door-way, may be about eleven or twelve inches wide, and about twelve or fourteen inches high, extending to the ſummit of the new back. The door-way is to be cloſed by a few bricks, by a tyle, or a fit piece of ſtone, placed in it without mortar, and confined in its place by means of a rabbet made for that purpoſe in the brick-work.”

A tradeſman finds the exact poſition of the new back, “by ſtanding within the chimney, and holding a plumb-line to the middle of the upper part of the breaſt of the chimney, or where the canal of the chimney begins to riſe perpendicularly. He marks the place on the hearth where the plumb falls, and meaſures back four inches: the point where theſe four inches end, will ſhow how far the new back is to be brought forward.”

“The width, which it will be beſt, in moſt caſes, to give to the back, is one third of the width of the opening of the fire-place. But it is not abſolutely neceſſary to conform rigorouſly to this deciſion, nor will it always be poſſible. Where the thickneſs of the wall of the chimney in front, meaſured from the front of the lintel to the breaſt within the chimney, is nine inches, ſet off four inches more for the width of the throat of the chimney, which, ſuppoſing the back of the chimney to be built upright, as it always ought to be, will give thirteen inches for the depth of the fire-place, meaſured on the hearth from the opening of the fire-place in front, to the back. In this caſe thirteen inches would be a good ſize for the width of the back; and three times thirteen inches, or thirty-nine inches for the width of the opening of the fire-place in front; and the angle made by the back of the fire-place, and the ſides of it, or covings, would be juſt 135 degrees, which is the beſt poſition they can have for throwing heat into the room.” But a variation in the depth or width of the fire-place, or a neceſſity to have the back larger or ſmaller than the ſize propoſed, will frequeutly prevent an exact adherence to theſe proportions. “No inconvenience, however, of any importance will ariſe from making the obliquity of the covings *leſs* than what is here recommended; but many cannot fail to be produced by making it much greater.”

Count Rumford thinks it neceſſary, that the new covings ſhould range with the fronts of the jambs, however thoſe jambs may project into the room, and not with the fronts of the old covings. But he gives no reaſon for this, except the danger of the obliquity of the new covings being greater than an angle of 135 degrees. He does not intend that every grate ſhall project as far as the front of the jambs, for in one part of his Eſſay he makes "the proper depth for grates deſtined for rooms of a middling ſize to be from ſix to eight inches," and the whole depth of the ſpace for a grate is thirteen inches, when all the proportions are ſuch as he eſteems moſt perfect.

He recommends "*rounding off* the inſide of the lintel, and bringing down the breaſt of the chimney to a level with the lower part of the lintel, when it is placed too high. This is done by a coating of plaſter, ſupported with nails or ſtuds, if neceſſary. And where the too great height of the breaſt of a chimney is owing to the height of the opening of the fire-place in front, the remedy is to lower the opening, by giving it a new lintel. When this is done, the ſlope of the old throat of the chimney is to be filled up with plaſter, ſo as to form one continued flat, vertical or upright plane ſurface with the lower part of the wall of the canal of the chimney; and a new breaſt is to be formed lower down, care being taken to round it off properly, and make it finiſh at the lower ſurface of the new lintel."

He alſo recommends "white-waſhing the covings, and every part within the fire-place, which is not expoſed to being ſoiled and made black by the ſmoke."

Having thus briefly ſtated every circumſtance which is thought material in the practical part of Count Rumford's plan, the next thing which claims attention is

The comparative excellence of IRON, BRICK, and STONE, for the purpoſe of conſtructing chimney fire-places.

From an idea that iron is not a good reflector of heat, Count Rumford recommends brick or ſtone, as the fittteſt materials for making the backs and covings of chimnies, and all the neceſſary apparatus, excepting only the grate for holding the fire, which he acknowledges muſt be made of iron. But though it were true that iron does not give ſo much heat as brick or ſtone, its comparative excellence in other reſpects ought not to be overlooked.

A building of bricks and mortar, in a chimney where fire is conſtantly uſed, will need frequent repairs, and if theſe be not timeouſly afforded, ſome part of the building will be in danger of tumbling down, and ſcattering the burning coals upon the floor: even ſtone when it is continually expoſed to intenſe heat, is much leſs durable than iron. Another inconvenience ariſes from the neceſſity of leaving an opening for the chimney-ſweeper above the fire. The tyle or ſtone which covers this opening muſt be removed as often as the chimney is ſwept; and if it be not properly replaced, it may tumble into the fire, and produce very alarming conſequences. The plan thus executed is not only deficient in point of convenience and ſafety, but alſo on account of its total want of elegance in the form and appearance of grates. To this mortifying deprivation all who diſcard iron muſt inevitably ſubmit. Inſtead of a beautiful and well-finiſhed grate, which throws a luſtre and cheerfulneſs around a comfortable fire-ſide, they muſt be ſatisfied with a few bars put into a heavy building of brick or ſtone. Grates of this kind may be equal to any other, in point of real uſefulneſs; but there is certainly nothing in their appearance that can pleaſe the eye, or recommend them to perſons of taſte, or to any one who can afford to purchaſe a good article, and who does not chuſe to appear mean and parſimonious.

In all theſe reſpects, the preference is certainly due to caſt iron grates, with bars, frets, and other ornaments of poliſhed ſteel. Caſt iron, employed for the whole of the neceſſary apparatus, will be found to be ſafer, more convenient, more elegant, and upon the whole more profitable than any other materials that can be uſed. The plates and covings of thoſe grates, which are ſold by W. Braidwood and Son, are joined in ſuch a manner as to admit of their being unſcrewed and removed at pleaſure; there is no danger of their mouldering away, or breaking down, ſo as to do any miſchief; and they may be had either of a plain and ſimple form, reſembling ordinary Carron grates, and at moderate prices, or fitted up in any ſuperior degree of elegance that may ſuit the taſte of purchaſers. Some of them will be reckoned an ornament in the fineſt drawing-rooms.

W. Braidwood and Son, before publiſhing their advertiſement, dated the 18th November, in which it was aſſerted that iron is fitter than brick or ſtone for the purpoſe of reflecting heat, had made a number of experiments on all theſe materials, by which it appeared to them that the fact was clearly eſtabliſhed. But on a more cloſe inveſtigation of the ſubject, they find, that the heat which they had underſtood to be communicated by reflection, was conducted, and not reflected by the different ſubſtances; a miſtake which inexperienced practitioners in matters of this kind may be very apt to fall into. The experiments therefore having had no direct tendency to prove that iron is either a better or a worſe reflector of heat than the other ſubſtances, it would be quite ſuperfluous to publiſh them. That iron is an excellent conductor of heat, is univerſally acknowledged. To what extent it poſſeſſes the power of communicating the heat which it receives, to bodies not in contact with it, either as a conductor, or as a reflector of heat, they have not been able to aſcertain with ſufficient accuracy; though they are fully perſuaded of the fact, that iron does poſſeſs the quality of throwing out heat in great abundance. The ſubject is of an intricate nature, and would require a more critical and copious inveſtigation, than would be conſiſtent with a due attention to other buſineſs, or with the nature and limits of a publication, which is merely intended as a ſhop-bill. It is highly probable, that *none* of the materials in queſtion excel much in the property of *reflecting* heat, unleſs when the iron is poliſhed, or when the brick and ſtone are white-waſhed, an operation which can be performed on unpoliſhed iron with equal propriety and effect. The degree of heat which is reflected by any ſubſtance, ſeems to depend more on its form, and on the ſmoothneſs, the brightneſs, and the white colour of its ſurface, than upon the nature of the ſubſtance itſelf.

The principal evidence therefore on which they found a favourable opinion of the warmth of caſt iron grates, by whatever means the heat received from them may be produced and tranſmitted, is the teſtimony of their ſenſes, confirmed by the general experience of mankind, who have long been perſuaded that all ſuch grates throw out a very conſiderable degree of heat, *becauſe they have been in uſe to feel that heat* *. And now that grates of the ſame metal are conſtructed in ſuch a manner, as to diminiſh the throat of the chimney to a proper ſize, while the covings are placed in a very oblique direction, the backs made perfectly upright, and the whole brought near the front of the opening of the fire-place, the increaſe of heat is very great. It is ſuch as will never fail to recommend theſe grates, and will be a valuable acquiſition to all who uſe them.

They have alſo contrived a method of ſupplying a deficiency which would ariſe from a vacant ſpace being left behind the back and covings. When the fire is bright, the plates of the grate are continually ſending forth a great quantity of heat on both ſides, and that part of it which is thrown out behind would be loſt by its paſſing ſuddenly up the chimney. This defect is ſupplied by incloſing as effectually as poſſible, the empty ſpace between the back and covings of the grate, and the old back and covings of the chimney; which is better in ſeveral reſpects than a ſolid building. There is one flat level top all the way round, inſtead of two high walls and a low one, which the paſſage for the chimney ſweeper makes it neceſſary to erect, when the work is executed with brick or ſtone. The heat produced by confining the air, when it can be done in a perfect manner, will be greatly ſuperior to that which is communicated by a building. And there is no danger of any accident or inconvenience occurring, like that which may ariſe from the ſoot lodging on the top of the walls at the narroweſt part of the chimney, for the empty ſpace is incloſed *a little below* the top of the back and covings of the grate, which effectually prevents any ſoot that may lodge there from falling into, or being kindled by the fire. At the ſame time it is eaſy to clean the place where the ſoot will lodge, by taking down the covings.

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* The ſingular penetration and ingenuity of the late Dr Franklin, might probably furniſh him with other proofs. Whatever theſe were, he certainly believed that iron, placed within a chimney, communicates the heat which it receives from burning fuel to the air of the room. In his *obſervations on ſmoky chimnies*, written in the year 1785, he ſays, " The flame then aſcending from the fire, was carried to ſtrike the upper plate, made it very hot, and its heat roſe and ſpread with the rarefied air into the room." P. 35.

There are other circumſtances which render the caſt iron apparatus for Count Rumford's chimney fire-places exceedingly convenient and uſeful. When it becomes neceſſary, in order to free a room from ſmoke, to lower the opening of the fire-place in front, which he ſuppoſes will frequently happen, it can be done with a great deal of neatneſs and convenience, and at a ſmall expence, by putting a caſt iron plate acroſs the top of the opening, of whatever dimenſions may be thought requiſite, and it may either be fixed, or moveable at pleaſure. Let it be obſerved however, that the neceſſity of having ſuch a plate may be expected more rarely to occur, when the grates are made of caſt iron; for the extreme heat of the metal rarefies the air in a high degree, and thus facilitates the aſcent of the ſmoke. In fine, when a family moves to another houſe, it is much leſs troubleſome and expenſive to carry along with them one or more caſt iron grates, than it would be to move any other materials that can be uſed in place of them.

The neceſſary apparatus for Count Rumford's chimney fire-places, will be erected by W. Braidwood and Son on old Carron grates, in a manner as complete as the form of ſuch grates will permit. And ſuitable caſt iron grates, either plain, or beautifully ornamented, will be furniſhed for chimnies which have been already finiſhed with brick or ſtone.

Beſide the regiſter ſtoves mentioned in the advertiſement, they keep an aſſortment of the patent kind originally made by Mr Brodie. Theſe have been found by long experience to be very effectual, in many inſtances, in curing, or greatly meliorating ſmoking chimnies. Few methods hitherto practiſed have been more univerſally ſucceſsful; and both the plates and the fire-places can be fitted up with every poſſible degree of elegance.

An Account of the Properties of ſome other CAST IRON ARTICLES, ſold by W. BRAIDWOOD and SON.

Light Tinned Boiling Utenſils.

Theſe conſiſt of goblets, from one pint to three gallons Engliſh meaſure; round and oval pots, from two to ten gallons; oval fiſh kettles, various ſizes; ſtewing pans, from ſix to twelve inches diameter; tea kettles and boilers, from four pints to two gallons: All of them as neat as copper veſſels, not much heavier, and entirely free from their pernicious quality. They are tinned, and ready for uſe, without any ſeaſoning; but never need to be retinned, which ſaves a great deal of expence. They are likewiſe annealed, that is, ſoftened by means of a charcoal fire, which renders them much leſs brittle than veſſels made of common caſt iron. They bear a great deal of fatigue without breaking. Cold water may be put into them when they are hot, without any danger, and they will even bear a fall upon ſtone, unleſs it be from a conſiderable height.

The following obſervations by Dr Franklin, on the quality of iron, contraſted with ſome other metals, will ſhow, in the ſtrongeſt point of view, the propriety, for the ſake of health, of giving it the preference.

"That iron is in its nature a metal perfectly wholeſome to "the body of man, is known from the beneficial uſe of Chalybeate or iron-mine waters, from the good done by taking "ſteel filings in ſeveral diſorders, and that even the ſmithy "water, in which hot irons are quenched, is found advantageous to the human conſtitution. The ingenious and learned Dr Deſaguliers relates an experiment he made, to try "whether heated iron would yield unwholeſome vapours. He "took a cube of iron, and, having given it a very great heat, "he fixed it ſo to a receiver, exhauſted by the air pump, that "all the air ruſhing in to fill the receiver, ſhould firſt paſs "through a hole in the hot iron. He then put a ſmall bird "into the receiver, who breathed that air without any inconvenience, or ſuffering the leaſt diſorder. But the ſame experiment being made with a cube of hot braſs, a bird put "into that air, died in a few minutes. Braſs indeed ſtinks "even when cold, and much more when hot. Lead too, "when hot, yields a very unwholeſome ſteam; but iron is "always ſweet, and, every way taken, is wholeſome and "friendly to the human body, except in weapons." *Letters and papers on philoſophical ſubjects, 4to, London,* 1769, pages 309, 310.

Cloſe Stoves, which ſtand in the middle of the floor.

Theſe are chiefly uſeful in places where there are no chimnies, and in tradeſmen's work-ſhops, where a great heat is required for drying their materials, or for other purpoſes. They can be placed in any part of a room or ſhop, the ſmoke being carried off by an iron pipe or funnel, which is fixed to the ſtove, and may be conveyed into a chimney, through the wall, or through a pane of a window.

Stoves of this ſort are often uſed in laundries, where they are of great ſervice. When the chimney is built up, there is much leſs duſt in the room, the cloths are more expeditiouſly dried, and the ſmoothing irons are conveniently heated on the top and ſides of the ſtove, by which means they are kept always clean.

There are alſo large and elegant patterns in the form of pedeſtals, vaſes, columns with gilded capitals, *&c.* which are uſed in halls and ſtair-caſes, and ſometimes in churches and other public buildings. Theſe have a very powerful effect, and when long funnels are applied to them, they give a very conſiderable degree of heat in any place, however large.

It has been objected to ſtoves of this kind, that they are unwholeſome, and give an unpleaſant ſmell; to which an anſwer ſhall be given in the words of Dr Franklin.

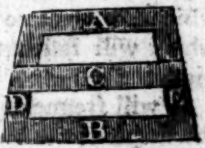
" It muſt be allowed, there may have been ſome cauſe to
" complain of the offenſive ſmell of iron ſtoves; this ſmell,
" however, never proceeded from the iron itſelf, which in its
" nature, whether hot or cold, is one of the ſweeteſt of me-
" tals, but from the general uncleanly manner of uſing thoſe
" ſtoves. If they are kept clean, they are as ſweet as an iron-
" ing box, which, though ever ſo hot, never offends the ſmell
" of the niceſt lady. But it is common to let them be greaſed
" by ſetting candleſticks upon them, or, otherwiſe, to rub
" greaſy hands on them; and, above all, to ſpit upon them
" to try how hot they are; which is an inconſiderate, filthy,
" unmannerly cuſtom; for the ſlimy matter of ſpittle, drying
" on, burns and fumes when the ſtove is hot, as well as the greaſe,
" and ſmells moſt nauſeouſly; which makes ſuch cloſe ſtove-
" rooms, where there is no draught to carry off theſe filthy
" vapours, almoſt intolerable to thoſe who are not from their
" infancy accuſtomed to them; at the ſame time, nothing is
" more eaſy than to keep them clean.

" That hot iron of itſelf gives no offenſive ſmell, thoſe
" know very well who have been preſent at a furnace when
" the work-men were pouring out the flowing metal to make
" large plates, and not the leaſt ſmell of it to be perceived.
" That hot iron doth not, like lead, braſs, and ſome other
" metals, give out unwholeſome vapours, is plain from the
" general health and ſtrength of thoſe who conſtantly work in
" iron; as furnace-men, forge-men, and ſmiths." Ib. p. 308, 309.

DIRECTIONS

For meaſuring chimney fire-places, which are to be altered on the plan recommended by Count Rumford; and for putting up the improved grates, which are made of caſt iron by W. Braidwood and Son, No. 6. Hunter's Square, Edinr.

MAKE a pattern of wood, exactly to the ſize and ſhape of the chimney, at the level of the lower edge of the lintel, and the whole deepneſs of the chimney from its back to the front of the noſings, or the point where the covings unite with the jambs. The pattern conſiſts of five pieces of thin flat wood, in this form. A to be placed cloſe to the back, and formed to its ſhape, the front of B to be on a line with the back part of the jambs. The moſt perfect method would be to mitre the ends of A and B into D and E, and to nail C on the upper ſides of D and E. When this is not done, be ſure to nail A, B, and C on the *upper* ſides of D and E. Or it may do fully as well to place C in the contrary direction, that is, from A to B; and in that caſe C, as well as D and E, muſt be put under A and B. If there be any difference between the ſhape and ſize of the chimney, at the level of the lower edge of the lintel, and at the height where the hobs or top-plates of the grate will ſtrike, let this be noted. Take alſo the exact height and width of the opening at the front of the noſings, and the thickneſs of the lintel, meaſured from its front to the front of the noſings. If there be no noſings, meaſure the height from the hearth to the lintel, and the width between the two jambs.



Hold a plumb-line to the middle of the breaſt of the chimney within, as high as can be reached; mark the place on the hearth where the plumb falls; meaſure the diſtance between it and the front of the jambs; and let this meaſure be carefully noted down.

Meaſure the height of the upper part of the breaſt of the chimney, or that part where the canal of the chimney begins to riſe perpendicularly. If the breaſt be too high, bring it down nearly to a level with the lower part of the lintel, by a coating of plaſter, ſupported with nails or ſtuds, if neceſſary. The plaſter muſt form one continued flat upright plane ſurface with the lower part of the wall of the canal of the chimney, till you come within a few inches of the lower ſurface of the lintel. Let the breaſt then be properly rounded off, and mention the height of the upper part of it from the lower part of the lintel. State alſo the exact breadth of the noſings.

The grate, with its caſt iron covings or ſide-plates, reaching to the top of the back, and properly fixed with nuts and ſcrews, is firſt ſet up. The plate formed to the ſhape of the chimney behind, is hung on the back and ſides of the grate in a horizontal direction. The whole is then placed in the chimney, the front of the grate being in moſt caſes on a line with the noſings, or the back part of the jambs. The plates which are intended to make an addition to the height of the grate are next to be put into their proper places. Set up firſt the two ſide-plates, running them along the top of the lower covings from the back to the front. And then ſet up the back, taking care to put the ſtubs or ſcrewed pieces of iron through the holes which are made to receive them. Laſtly, ſcrew on the nuts, which will faſten the whole upper part of the back and covings.

It will frequently be neceſſary to cut the upper covings to the ſhape of the breaſt of the chimney. This can be eaſily done by any ſmith, if patterns firſt be made of wood, taken in the exact direction in which the covings are to ſtand; and there is no difficulty in making ſuch patterns when the whole apparatus is on the ſpot.

If the above directions are not perfectly underſtood, ſet up the grate with the upper back and covings on the floor, before you attempt to put them within the chimney. This will be more eaſily done, and will give a perfect idea how the different pieces muſt be joined, when the grate is put into its proper place.

That part of the inſide of the lintel which is immediately above the fire, as well as the breaſt of the chimney within, ought to be rounded off, and made as ſmooth as poſſible.

No building is requiſite, except when the apparatus is erected on an old Carron grate. In that caſe it is proper to build behind the grate to the height of the hobs or top-plates of the old grate; but the building muſt not be carried higher.

When it becomes neceſſary to move the grate, this is done merely by unſcrewing the nuts of the upper covings, and taking down the upper back and covings, the former of which muſt be firſt moved; and then there will be nothing to prevent the grate from being drawn forward on the hearth.

Proper perſons will be ſent to meaſure chimnies, and to put up the grates for which nothing will be charged, when they are ſituated in Edinburgh, Leith, or any part of the ſuburbs.

DIRECTIONS for taking the dimenſions of CHIMNIES for ordinary Carron GRATES.

MEASURE the exact width of the chimney where the front of the grate ought to ſtand, and the width at the diſtance of 11½ inches from the front meaſure. The beſt method of taking theſe meaſures is by a pattern of wood, made to the ſhape of the chimney: this is particularly neceſſary when the covings are curved. Mark on the two ends of the pattern how far the front of the grate ought to come forward. Mention the height from the hearth to the lintel, and *which* is the upper ſide of the pattern.

A chimney is meaſured for a regiſter ſtove, merely by taking the exact height and width of the opening of the fireplace at the noſings, or the inſide of the lintel.

DIRECTIONS for cleaning Carron GRATES and STOVES.

MIX a little Black Lead Powder with ſuch a quantity of Ale or Porter as will bring it to the conſiſtence of Treacle. Stir the mixture well, and lay it upon the Plates of the Grate or Stove, as thin as can be done with a painter's bruſh. When it begins to turn dry, rub the plates with a hard bruſh, till they attain a bright ſhining ſurface.

The work may be more perfectly done by uſing the white of an Egg, inſtead of Ale or Porter.

The bruſhes muſt never be applied to any other purpoſe, otherwiſe the black lead will loſe its effect.

If the plates are ruſted, rub them well with a hard bruſh before laying on the mixture; and if any oil or greaſy black has been put upon them, it muſt be waſhed out with warm water and ſoap, or rubbed off with wet aſhes.

EDINBURGH,
Dec. 1. 1797.

MVSEVM
BRITAN
NICVM